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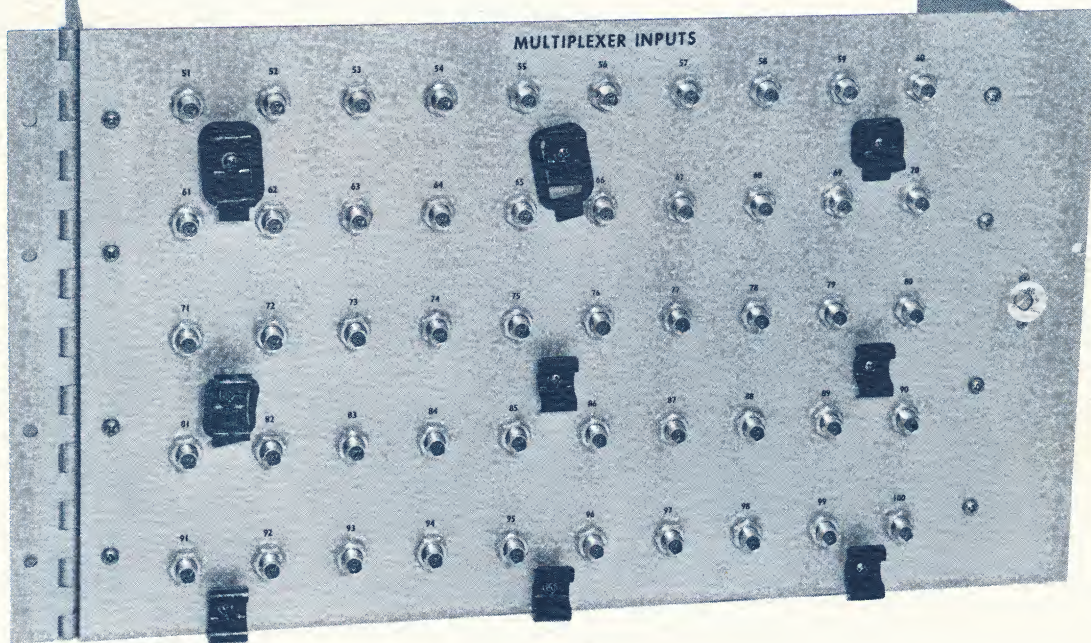
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**MOLECULAR RESEARCH, INC.**

WEST PALM BEACH, FLORIDA

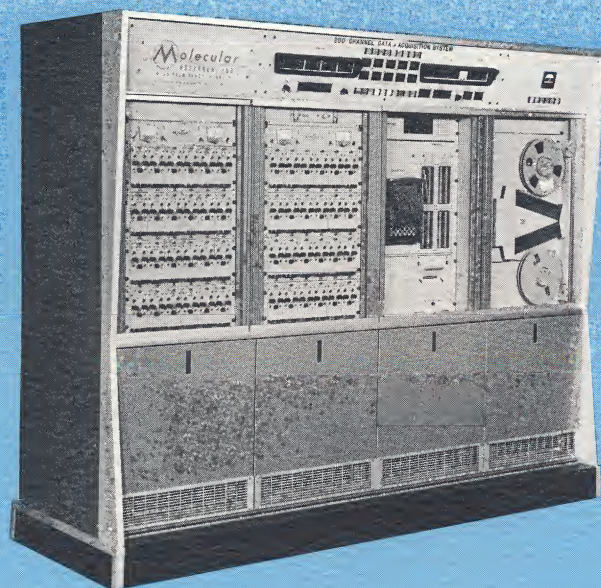
**MODEL 9500**

**LOW LEVEL RELAY MULTIPLEXER**



☐ **LOW LEVEL RELAY MULTIPLEXER**





200 CHANNEL DATA ACQUISITION  
SYSTEM DESIGNED AND MANUFACTURED BY MRI UTILIZING THE MODEL  
9500 LOW-LEVEL MULTIPLEXER



## MODEL 9500 LOW-LEVEL RELAY MULTIPLEXER *for . . .*

☐ PROCESS CONTROL SYSTEMS

☐ DATA ACQUISITION SYSTEMS

☐ COMMUNICATION SWITCHING

## FEATURES

☐ The Molecular Research, Inc. Model 9500 Low-Level Relay Multiplexer provides a unique solution to the problems involved in multiplexing control and data signals from end instruments such as transducers for strain, temperature, pressure, flow, torque, etc. The MRI Model 9500 should be specified where high operating speed, shielding, repeatability, accuracy and reliability are of primary concern. The MRI Model 9500 will provide the most reliable, high-performance method of switching low-level signals. The MRI Model 9500 has the advantage of high "on" to "off" switching ratios not possible with solid-state multiplexers. Operating speeds are in the micro-second range which provides high speeds compatible with programmable gain amplifiers, digital voltmeters and other equipment which generally utilize multiplexed inputs. The very low thermal and

magnetic noise capabilities are ideal for measurements in the low millivolt full-scale range. The switch utilized for data channels of the MRI Model 9500 is extremely reliable and conservatively provides over one billion operations without failure.

The MRI Model 9500 Low-Level Relay Multiplexer provides the capability of applying a common calibration signal to all data lines upon external command.

A calibration relay is included in each channel and when activated will switch the signal input lines to the calibration voltages. The performance of the multiplexer is in no way degraded when in the calibration mode. A single cable on the multiplexer chassis connects the calibration supply to each of the calibration relays.



# APPLICATIONS

## PROCESS CONTROL SYSTEMS

□ The MRI Model 9500 has a wide range of uses in the area of process control. A typical application is shown in Figure 1 below, where a process control computer must gather data from many process variables in a closed-loop control system. In a system of this type, the multiplexer can be programmed for random or sequential selection of data from instru-

mentation devices such as flow gauges, pyrometers, or pressure gauges. These signals are then amplified, converted to digital data words, and entered into a digital data processor or computer. The computer can then make changes in the process variables, thus providing a closed-loop control system.

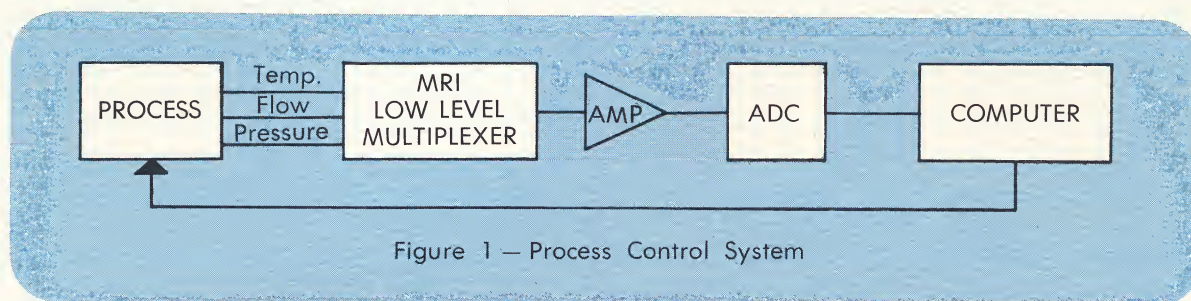


Figure 1 — Process Control System

## DATA ACQUISITION SYSTEMS

□ Missile and aircraft design and tests require extensive measurements of physical phenomena such as strain, temperature, vibration, etc. Tests such as missile firings, jet engine tests and aircraft vibration tests require that data be gathered and recorded in relatively short periods of time. The MRI Model

9500 permits sampling of hundreds of these measurements each second. Figure 2 indicates a typical data-acquisition system where end instruments are multiplexed through the MRI Model 9500; amplified, converted to digital data words, and recorded on magnetic tape for data reduction.

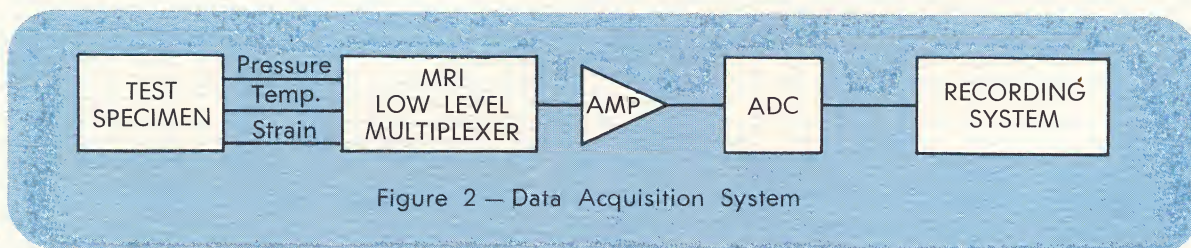


Figure 2 — Data Acquisition System

## COMMUNICATIONS SWITCHING

□ The high-speed operation and low-level signal handling capability of the MRI Model 9500 Multiplexer is such that it has a wide range of applications in communication control systems. Circuit transfer can be made with a minimum of lost time. The system can be time-sequenced and used to program remote systems or controlled by signal strength or

signal-to-noise detectors. The MRI Model 9500 Multiplexer provides very low losses due to the high "on" to "off" isolation ratio not obtainable in solid-state multiplexers. A typical application of the MRI Model 9500 Multiplexer in this type system is shown in Figure 3.

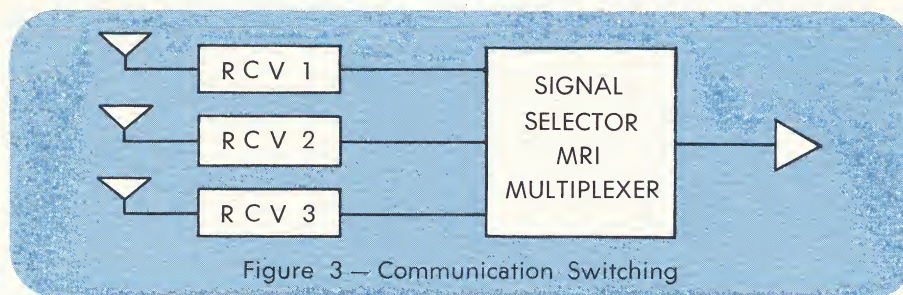


Figure 3 — Communication Switching



## CHARACTERISTICS

### Number of channels

Available in 50-channel groups

### Sampling rate

200 samples per second maximum

### Input voltage

5 millivolts full-scale to 10 volts full-scale (microvolt resolution)

### Channel-to-Channel Offset

1 microvolt

### Input Impedance

1000 megohms minimum

### Common-mode voltage

$\pm 200$  volts DC or peak AC

### Switch Contact Rating

0 to 10 volts at 1 milliamp

### Switch Contact Configuration

3 PST (See Figure 4)

### Calibration Command

28 VDC

### Cross talk

1 microvolt maximum

### Noise

1.5 microvolts maximum

### Control Level

6 volt logic 50 ma

### Temperature

$-55^{\circ}\text{C}$  to  $70^{\circ}\text{C}$

### Shock and Vibration

Mil-Standard 202 and Mil-C-4856

### Physical

Mounts in standard 19-inch rack 10½ inches high by 6¾ inches deep.

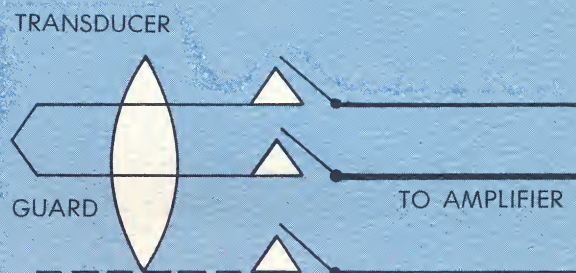
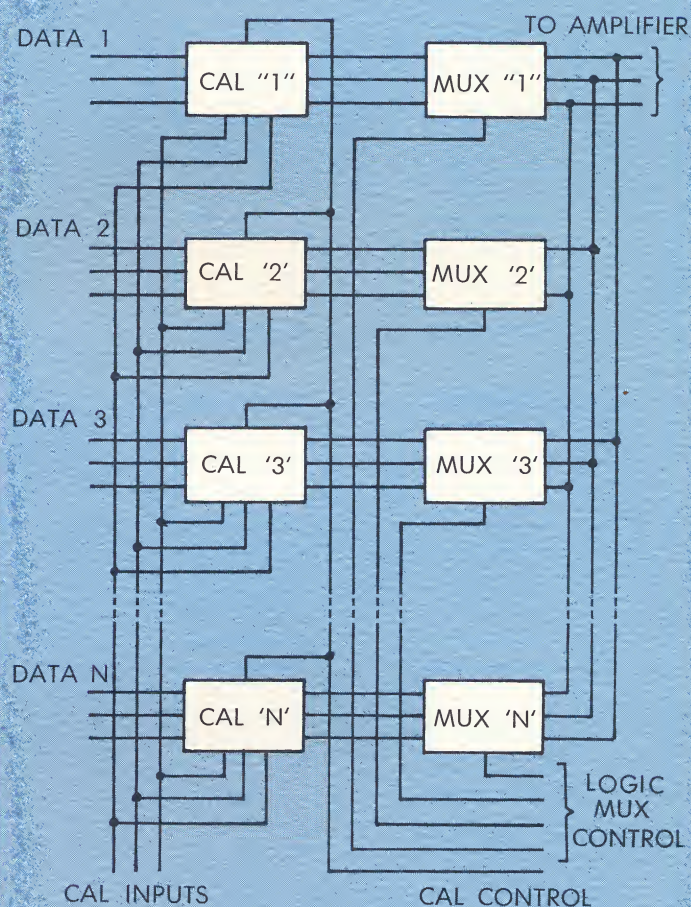


Figure 4 — Switch Contact Configuration



Multiplexer Block Diagram

FOR MORE INFORMATION OR A DEMONSTRATION CONTACT:



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